

# Rajalakshmi Engineering College

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Batch: 2028

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## NeoColab\_REC\_CS23231\_DATA STRUCTURES

### REC\_DS using C\_Week 2\_COD\_Question 1

Attempt : 1

Total Mark : 10

Marks Obtained : 10

### Section 1 : Coding

#### 1. Problem Statement

Your task is to create a program to manage a playlist of items. Each item is represented as a character, and you need to implement the following operations on the playlist.

Here are the main functionalities of the program:

Insert Item: The program should allow users to add items to the front and end of the playlist. Items are represented as characters. Display Playlist: The program should display the playlist containing the items that were added.

To implement this program, a doubly linked list data structure should be used, where each node contains an item character.

**Input Format**

The input consists of a sequence of space-separated characters, representing the items to be inserted into the doubly linked list.

The input is terminated by entering - (hyphen).

### ***Output Format***

The first line of output prints "Forward Playlist: " followed by the linked list after inserting the items at the end.

The second line prints "Backward Playlist: " followed by the linked list after inserting the items at the front.

Refer to the sample output for formatting specifications.

### ***Sample Test Case***

Input: a b c -

Output: Forward Playlist: a b c

Backward Playlist: c b a

### ***Answer***

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
struct Node {  
    char item;  
    struct Node* next;  
    struct Node* prev;  
};
```

```
void insertAtEnd(struct Node** head, char item) {  
    Node * temp=(Node *)malloc(sizeof(Node));  
    temp->prev=NULL;  
    temp->next=NULL;  
    temp->item=item;  
    if(*head==NULL)  
    {  
        *head=temp;  
    }  
    else
```

```

    {
        Node * p=*head;
        while(p->next!=NULL)
        {
            p=p->next;
        }
        p->next=temp;
        temp->prev=p;
    }
}

void displayForward(struct Node* head) {
    Node * p=head;
    while(p!=NULL)
    {
        printf("%c",p->item);
        p=p->next;
    }
    printf("\n");
}

```

```

void displayBackward(struct Node* tail) {
    Node * p=tail;
    while(p!=NULL)
    {
        printf("%c",p->item);
        p=p->prev;
    }
    printf("\n");
}

```

```

void freePlaylist(struct Node* head) {
    Node * p=head;
    while(p!=NULL)
    {
        Node *a=p->next;
        free(p);
        p=a;
    }
}

```

```

int main() {
    struct Node* playlist = NULL;
    char item;

```

```
while (1) {
    scanf(" %c", &item);
    if (item == '-') {
        break;
    }
    insertAtEnd(&playlist, item);
}

struct Node* tail = playlist;
while (tail->next != NULL) {
    tail = tail->next;
}

printf("Forward Playlist: ");
displayForward(playlist);

printf("Backward Playlist: ");
displayBackward(tail);

freePlaylist(playlist);

return 0;
}
```

**Status :** Correct

**Marks : 10/10**